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PATENT COOPERATION TREATY



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P045647	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/JP2003/009612	International filing date (day/month/year) 29 July 2003 (29.07.2003)	Priority date (day/month/year) 29 July 2002 (29.07.2002)
International Patent Classification (IPC) or national classification and IPC F16C 33/66, 33/58, 37/00, 41/00, 19/16, 19/26, F16N 13/16, 29/02, B23Q 11/12		
Applicant NSK LTD.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.	
2. This REPORT consists of a total of <u>6</u> sheets, including this cover sheet.	
<input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).	
These annexes consist of a total of _____ sheets.	
3. This report contains indications relating to the following items:	
I <input checked="" type="checkbox"/>	Basis of the report
II <input type="checkbox"/>	Priority
III <input type="checkbox"/>	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV <input checked="" type="checkbox"/>	Lack of unity of invention
V <input checked="" type="checkbox"/>	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI <input checked="" type="checkbox"/>	Certain documents cited
VII <input type="checkbox"/>	Certain defects in the international application
VIII <input type="checkbox"/>	Certain observations on the international application

Date of submission of the demand 22 December 2003 (22.12.2003)	Date of completion of this report 19 October 2004 (19.10.2004)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

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I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the claims:
 pages _____, as originally filed
 pages _____, as amended (together with any statement under Article 19,
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the drawings:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item. These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☒ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☒ not complied with for the following reasons:

The subject matters of claims 1-39 and 48-106 relate to a grease (lubricant).

The subject matters of claims 40-47 relate to a cutting liquid.

These two groups of claims are not considered to be a group of inventions so linked as to form a single general inventive concept.

The International Preliminary Examining Authority considers the requirement of unity of invention is satisfied in the following ranges:

Claims 1-39 and 48-106

The International Preliminary Examining Authority considers the following portions of the international application relate to a major invention:

Claims 1-39 and 48-106

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
- ☐ the parts relating to claims Nos. _____

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	2, 9-30, 37, 40-52, 54, 56, 59-106	YES
	Claims	1, 3-8, 31-36, 38-39, 53, 55, 57-58	NO
Inventive step (IS)	Claims	9, 14-20, 37, 40-47, 63-68, 82-83, 89-90, 96-97, 100-106	YES
	Claims	1-8, 10-13, 21-36, 38-39, 48-62, 69-81, 84-88, 91-95, 98-99	NO
Industrial applicability (IA)	Claims	1-106	YES
	Claims		NO

2. Citations and explanations

The subject matters of claims 1, 3-8, 31-36, 38, 39, 53, 55, 57 and 58 do not appear to be novel, since they are described in document 1 [JP, 2002-130590, A (NSK Ltd.), 9 May, 2002 (09.05.02) (Family: none)] or document 2 [EP, 1197702, A1 (NSK Ltd.), 17 April, 2002 (17.04.02), & JP, 2002-188650, A, & US, 2002/0048517, A1] respectively cited in the ISR.

The subject matters of claims 2, 27, 28, 54, 72, 73 and 75-77 do not appear to involve an inventive step in view of document 1 or 2 cited in the ISR, and document 3 [JP, 9-68231, A (NTN Corp.), 11 March, 1997 (11.03.97) (Family: none)] or document 4 [WO, 94-21932, A2 (Barmag AG), 29 September, 1994 (29.09.94), & JP, 7-506896, A, & CN, 1105801, A, & DE, 4404301, A1, & US, 5711615, A, & EP, 854314, A2, & KR, 156029, B, & US, 5971107, A, & RU, 2142078, C, & US, 6105724, A] respectively cited in the ISR. A person skilled in the art could have easily applied the lubricating oil replenishing mechanism described in document 3 or 4 to the main shaft device described in document 1 or 2.

The subject matters of claims 29, 30 and 74 do not appear to involve an inventive step in view of document 1 or 2 and document 4 respectively cited in the ISR. A person skilled in the art could have easily applied the lubricating oil replenishing mechanism having an O ring described in document 4 to the main shaft device described in document 1 or 2.

The subject matters of claims 10, 59, 78, 84 and 85 do not appear to involve an inventive step in view of document 1 or 2 cited in the ISR, and document 5 [Microfilm of the specification and drawings annexed to the written application of Japanese Utility Model Application No. 158477/1988 (Laid-open No. 78247/1990), 15 June, 1990 (15.06.90) (Family: none)] or document 6 [JP, 8-309643, A (Enshu Ltd.), 26 November, 1996 (26.11.96) (Family: none)] or document 7 [JP, 6-33942, A (Matsuura Machinery Corp.), 8 February, 1994 (08.02.94) (Family: none)] respectively cited in the ISR. A person skilled in the art could have easily applied the lubricating oil replenishing mechanism having a rotary sensor and corresponding to a rotating speed describes in any one of documents 5-7 to the main shaft device described in document 1 or 2.

The subject matters of claims 21-23 and 69-71 do not appear to involve an inventive step in view of document 1 or 2 cited in the ISR and document 8 [JP, 2001-263580, A (Lube Corp.), 26 September, 2001 (26.09.01) (Family: none)] cited in the ISR. A person skilled in the art could have easily applied the plunger type lubricating oil feed pump described in document 8 to the main shaft device described in document 1 or 2. A Teflon tube is a well-known technique.

The subject matters of claims 24-26 and 48-52 do not appear to involve an inventive step in view of document 1 or 2 cited in the ISR and document 9 [JP, 9-317778, A (NTN Corp.), 9 December, 1997 (09.12.97) (Family: none)] cited in the ISR. A person skilled in the art could have easily applied the lubricating oil replenishing mechanism having a cooling means described in document 9 to the main shaft device described in document 1 or 2.

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VI. Certain documents cited

1. Certain published documents (Rule 70.10)

Application No. Patent No.	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
JP 2003-83343 A [E, Y]	19.03.2003	13.09.2001	
JP 2003-74567 A [E, Y]	12.03.2003	03.09.2001	
JP 2003-49850 A [E, Y]	21.02.2003	06.08.2001	

2. Non-written disclosures (Rule 70.9)

Kind of non-written disclosure	Date of non-written disclosure (day/month/year)	Date of written disclosure referring to non-written disclosure (day/month/year)

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Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V2

The subject matter of claim 56 does not appear to involve an inventive step in view of document 1 or 2 cited in the ISR and document 10 [JP, 2001-241451, A (NSK Corp.), 7 September, 2001 (07.09.01) (Family: none)] or document 11 [CD-ROM of the specification and drawings annexed to the written application of Japanese Utility Model Application No. 102457/1991 (Laid-open No. 45245/1993) (Kitashiba Electric Co., Ltd.), 18 June, 1993 (18.06.93) (Family: none)] respectively cited in the ISR. A person skilled in the art could have easily applied the roller bearing described in document 10 or 11 to the main shaft device described in document 1 or 2.

The subject matters of claims 11-13, 60-62, 79-81, 86-88, 91-95, 98 and 99 do not appear to involve an inventive step in view of document 1 or 2 and document 7 respectively cited in the ISR. A person skilled in the art could have easily applied the lubricating oil replenishing mechanism having a rotary sensor and using an integrated rotating speed value described in document 7, to the main shaft device described in document 1 or 2.

The subject matters of claims 9, 14-20, 37, 40-47, 63-68, 82, 83, 89, 90, 96, 97 and 100-106 are neither described in any of the documents cited in the ISR nor obvious to a person skilled in the art.